

XVIII. *Descriptions of some New Species of Hymenopterous Insects belonging to the Families Thynnidæ, Masaridæ and Apidæ.* By FREDERICK SMITH, V.P. Ent. Soc.

[Read 1st May, 1861.]

THE insects described in the present paper, with one or two exceptions, are the property of F. Du Boulay, Esq., who has placed them in my hands for examination. Amongst these are some of the finest species of the various genera to which they belong, particularly, I may point out, those of the rare genus *Paragia*, three new species of which add greatly to the interest of this small collection of Australian Hymenoptera. But the most remarkable insect described is a bee, belonging to the section of leaf-cutting bees; this I have characterised as forming a new genus (*Thaumatosoma*), principally from the circumstance of its possessing elongated capitate antennæ; I know but of one other instance in which a bee has true capitate antennæ; this is in a species of *Tetralonia* from Brazil.*

Fam. THYNNIDÆ.

Genus THYNNUS.

Thynnus ventralis.

T. luteus; antennis abdominisque segmentis apicalibus nigris; alis fuscis.

Female.—Length 10 lines.

Pale luteous, the antennæ and tips of the mandibles black; a transverse black line on the vertex, from which two angular stains emanate, each enclosing one of the posterior ocelli; the pit, in which the anterior ocellus is situated, is also black; all the sutures of the thorax black; the wings dark brown; the basal joint of the tarsi more or less obscurely ferruginous, the rest of

* A description of this species is given, *post*, p. 398. There are three genera of "long-horned bees," in which the males have their antennæ frequently as long as, or in some cases even longer than, the body. The first genus established, *Eucera*, is at once known from the others by the species having only two submarginal cells in the anterior wings; the other genera, *Tetralonia* and *Melissodes*, have each three submarginal cells, but *Tetralonia* has 6-jointed maxillary palpi and 4-jointed labial palpi, whereas *Melissodes* has both maxillary and labial palpi 4-jointed.

the joints black ; abdomen with the fourth and following segments black ; the fourth with two transverse ovate yellow maculæ, the fifth with two minute spots ; beneath black.

Hab. Swan River.

Genus *ÆLURUS*.

Ælurus agilis.

Æ. niger ; capite thoraceque ferrugineo-variegatis ; abdomine ferrugineo, segmento primo nigro ; alis hyalinis, nervuris nigris.

Male.—Length 6 lines.

Black ; the clypeus, the scape in front, and the mandibles, ferruginous ; the cheeks with a long cinereous beard ; the head closely and coarsely punctured. The thorax beneath, the legs, a large macula beneath the wings, and the pro- and meso-thorax ferruginous, the latter with an oblong black patch extending from its base to the apex ; the scutellum ferruginous ; the post-scutellum yellow ; the sides of the metathorax clothed with long cinereous pubescence ; the wings hyaline, the nervures black ; the legs more or less black or fuscous above ; abdomen ferruginous, with the basal segment black ; the thorax is coarsely punctured, the abdomen with distant shallow punctures, except the basal segment, which is closely and finely punctured.

Hab. Swan River.

Genus *RHAGIGASTER*.

Rhagigaster simillimus.

R. niger ; maculâ sub alis abdominisque segmentis duobus apicalibus ferrugineis ; tibiis tarsisque testaceis.

Male.—Length 8 lines.

Black ; head and thorax rugose and covered with short cinereous pubescence ; a large oblong ferruginous macula beneath the wings, which are hyaline, their nervures black ; the tibiæ and tarsi rufo-testaceous, with the claw joint fuscous ; abdomen black and shining, the two apical segments ferruginous, the tip of the ultimate one black.

Hab. Swan River.

Rhagigaster flavifrons.

R. niger ; capite antice flavo ; thorace ferrugineo.

Female.—Length 8 lines.

Black ; the head distantly and finely punctured ; the anterior portion of the head as high as the vertex of the eyes, and the

mandibles yellow; the head subquadrate, slightly narrowed behind; thorax ferruginous, finely and closely punctured, with a number of larger scattered punctures; the articulations of the legs and the tarsi rufo-testaceous; abdomen elongate and shining, the second segment transversely striated, the apex ferruginous and longitudinally striated.

Hab. Swan River.

Fam. MASARIDÆ.

Genus PARAGIA, Shuck.

This genus was established in the year 1837, at which time only a single example was known; since that period nine additional species have been described. I here add three new and beautiful species to the list, making the total number thirteen. In the generic characters given by Shuckard and drawn from the type *Paragia decipiens*, the trophi are not characterized, but Saussure has figured them in his Monograph of the Family *Masaridæ*, in which this genus is placed—the maxillary palpi being six-jointed, the labial four-jointed. That this is not a social genus of wasps, I think is proved by an examination of the tarsal claws, which are bifid, a character nowhere found hitherto amongst the social *Vespidæ*, but characteristic of all the solitary species. The type specimen described by Shuckard is now in the British Museum, and proves to be in a discoloured, bad condition; I therefore add, in the list of the species of the genus, a more correct description, drawn from specimens obtained from Adelaide in the finest state of preservation. All the known species are from Australia and Tasmania.

1. *Paragia decipiens*, Shuck. Trans. Ent. Soc. ii. 82, pl. viii.
fig. 3, ♀.

Sauss. Mon. Masar. p. 54.

P. nigra, opaca; abdomine sulphureo.

Female.—Length 9 lines.

Black, opaque; head and thorax shagreened, with two confluent yellow spots between the antennæ; a narrow interrupted line on the anterior margin of the prothorax and a minute spot beneath the wings sulphur-yellow; wings dark fuscous, palest at their posterior margins; abdomen sulphur-yellow, the base of the first segment black, from which a narrow black line emanates and runs down the upper surface of the segment to its posterior margin.

Male.—This sex has the clypeus, an abbreviated line on the inner margin of the eyes, two minute spots between the antennæ,

and the scape in front, yellow; the anterior tibiæ are yellow in front; the second segment of the abdomen is produced beneath into a large pointed tubercle.

Hab. Adelaide.

2. *Paragia tricolor*, Smith, Trans. Ent. Soc. ser. 2, i. 41, pl. v. fig. 1, ♂.

„ *Smithii*, Sauss. Mon. Masar. p. 55, 3, t. 2, fig. 1, ♀.

Hab. Adelaide.

3. *Paragia Saussurii*, Smith, Cat. Vesp. p. 2, 3, ♀.

„ *tricolor*, Sauss. Mon. Masar. p. 54, 2, ♀ (nec Smith).

Hab. Perth, W. Australia.

4. *Paragia odyneroides*, Smith, Trans. Ent. Soc. ser. 2, i. 42, pl. v. fig. 2.

Sauss. Mon. Masar. p. 56, 4.

Hab. Hunter River, Australia.

5. *Paragia australis*, Sauss. Mon. Masar. p. 57, 5, ♂, ♀.

Hab. Tasmania.

6. *Paragia bicolor*, Sauss. Mon. Masar. p. 58, 6, .

Hab. Australia.

7. *Paragia bidens*, Sauss. Mon. Masar. p. 59, 7, ♂, ♀.

Hab. Adelaide.

8. *Paragia predator*, Sauss. Mon. Masar. p. 59, 8, ♀.

Hab. Australia.

9. *Paragia pictifrons*, Smith, Cat. Vesp. p. 2, 9, ♀.

Hab. Swan River.

10. *Paragia deceptor*, Smith, Trans. Ent. Soc. ser. 3, i. 56, ♀.

Hab. Adelaide.

11. *Paragia calida*.

P. nigra; capite thoraceque profunde punctatis, flavoque variegatis; abdomine aurantiaco; segmentis primo et tertio nigris; alis fuscis.

Male.—Length 6 lines.

Black; the head and thorax thickly covered with deep confluent punctures; the clypeus, an oblong-shaped macula widest at the apex above it, and a line on the inner orbit of the eyes not reaching their summit, yellow; the prothorax bordered with orange along its anterior margin; the tibiæ and tarsi ferruginous, the anterior tibiæ with a fuscous stain behind, and the intermediate and posterior pairs with a similar stain outside; the wings fuscous,

the anterior pair very dark along the anterior margin; abdomen bright orange-red, the first and third segments black, the latter with its posterior margin narrowly bordered with orange, the margin waved anteriorly; the basal segment with a central longitudinal line, not deeply impressed, and the line is orange towards the posterior margin of the segment; the second segment narrowly black at its basal margin, most broadly so in the centre.

Var.—The orange border to the prothorax recurved at the lateral angles, and enclosing a triangular black shape on the face of the truncation; the compressed tooth on the lateral margins of the metathorax orange-red; the basal segment of the abdomen with only two united bilobed black spots.

Hab. Adelaide.

12. *Paragia venusta*.

P. nigra, aurantiaca multipicta; abdominis basi et segmento tertio aurantiacis; alis hyalinis, anticis margine anteriori fusco.

Female.—Length 5 lines.

Black, opaque; the clypeus, a coronet-shaped spot above and a line at the inner and outer orbits of the eyes, not reaching to their summit, the prothorax, an epaulet over the tegulæ, the scutellum, a minute spot on the mesothorax before the scutellum, a spot on each side of the metathorax, another beneath the wings, and the legs, all orange-yellow; the coxæ black; the wings hyaline, with the anterior margin of the superior pair dark fuscous; the basal segment of the abdomen, an interrupted narrow band at the basal margin of the second, the third segment, the apical margin of the two following, and the sixth segment entirely, orange-yellow; beneath, the third segment entirely, and the apical margin of the first and second segments, orange.

Hab. Swan River.

13. *Paragia vespiformis*.

P. nigra; capite thoraceque flavo-variegatis; abdomine fasciis quinque flavis; alis subhyalinis.

Female.—Length 7 lines.

Black and opaque; the clypeus, base of the mandibles exteriorly, a broad stripe along the inner margin of the eyes extending upwards from the base of the mandibles to the insertion of the antennæ, a shorter narrow stripe above the broad one, and also a short thin line above each antenna, yellow; behind the eyes there is also a yellow stripe; a narrow line on the anterior

margin of the thorax, a minute spot in the middle of the mesothorax, the inner margin of the tegulæ, the posterior margin of the scutellum, and a large ovate spot on each side of the metathorax, yellow; a subtriangular spot beneath the wings, and the legs beneath, yellow; a yellow spot on the intermediate and posterior coxæ, all the trochanters, the base of the anterior and intermediate coxæ, as well as the anterior tibiæ, black; the wings subhyaline, the nervures black; a broad yellow fascia, slightly interrupted in the middle, on the margin of the basal segment of the abdomen; the three following segments have each a narrower interrupted fascia; on the apical margin of the fifth segment an entire fascia, emarginate in the middle; beneath yellow, the second segment having a transverse black spot at its basal margin, and the three following having each a narrow central black stripe at the basal margin; the sixth segment black, with the tip more or less yellow.

Hab. Swan River.

Fam. APIDÆ, Leach.

Genus THAUMATOSOMA, n. g.

Labial palpi four-jointed, the two basal joints elongate, their length about equal, the third and fourth joints minute and subclavate, inserted at the apex of the second joint; the labial palpi and the labium of equal length. The maxillary palpi two-jointed, minute; the basal joint short, stout and cylindrical, the second about the same length as the first, but much more slender and pointed at the apex. The basal lobe of the maxillæ shorter than the apical one, which is elongate, lanceolate and curved. Head as wide as the thorax; eyes large, lateral and elongate-ovate; the ocelli three in a triangle on the vertex, the posterior pair placed in a line with the posterior margin of the eyes; the labrum elongate, produced and rounded anteriorly; the antennæ capitate (in the male), elongate, reaching to the middle of the abdomen, the club compound, formed of the two apical joints compressed and pyriform. The anterior wings have one marginal and two submarginal cells, the latter receiving both the recurrent nervures, the first near the basal, the second near the apical angle of the cell. The legs simple. Abdomen oblong, the sides parallel, rounded at the base and apex.

It will be seen that the above characters, with the exception of the capitate antennæ, are those of the genus *Megachile*; but the exceptional character is so remarkable when possessed by a member of the great family *Apidæ*, that I have thought it desirable to depart from the rigid observance of those laws which usually

regulate the formation of genera. The insect, for the reception of which I have established the present genus, is perhaps strictly a species of *Megachile*, since in that genus we find an infinite variety in the form of some organs in the male sex of different species; we have one species found in this country, *Megachile Willughbiella*, of which Mr. Kirby observes, "This sex (male) of our insect exhibits a peculiarity which none of those that are related to it in the form of the anterior tarsus possess; the last joint of its antennæ is larger than any of the rest, which gives them some resemblance to those of a *Papilio*." The antennæ thus described are, however, exactly like those of the majority of the males of *Megachile*, with the exception of the apical joint, which is compressed, and, when viewed laterally, presents the club-shaped form alluded to. In the insect here described the antennæ are extremely slender and elongate, as in the genus *Eucera*, with the two apical joints forming a knob, or club, as in the beautiful Lepidopterous genus *Argynnis*.

Thaumatoma Duboulaii. (Pl. XXI. fig. 1.)

Male.—Length 5 lines.

Black, the head and thorax opaque, very finely and closely punctured; the face with a thin clothing of long silvery pubescence, that on the clypeus is more dense, shorter, and has a yellowish tinge; the antennæ ferruginous, with the apical knob or club black. The sides of the thorax with a thin cinereous pubescence; the wings subhyaline, their nervures black; the tegulæ rufo-testaceous behind. Abdomen shining and closely punctured; the posterior margins of the segments with a narrow fringe of white pubescence; the fourth segment clothed with fulvous; the fifth and sixth finely rugose, the latter slightly but widely emarginate; the seventh segment concealed beneath the sixth, its margin armed on each side with a short acute tooth, and also having two longer blunt marginal spines which are equidistant from each other and from the lateral spines; the basal segment produced beneath into a blunt projecting node.

The specimen described is in bad condition; judging from the ragged state of the wings, and the rubbed thorax and abdomen, it must have been long disclosed at the time of capture; the white abdominal bands are nearly obliterated. I have named it, as a mark of compliment and encouragement to its captor, F. Du Boulay, Esq.

Hab. West Australia.

Supplementary Paper.

[Read 7th August, 1865.]

IN addition to the figure and details of *Thaumatoma Duboulaii*, I have added to the Plate some remarkable forms of antennæ of other species of Aculeate Hymenoptera, and herewith append short descriptions of the insects themselves.

There are two or three known species of bees, the males of which have the apical joint of the antennæ compressed, so that when viewed sideways, as Mr. Kirby remarks, "it gives them somewhat the appearance of those of a *Papilio*;" such is the the antenna of *Nomia Kirbii*, as will be seen by the figure, but this, when viewed from above, appears to be of the ordinary form; in the case of *Thaumatoma* it is quite different, and the imitation of the antenna of a *Papilio* is complete; all the joints of the flagellum are attenuated and thread-like, except the two apical, which are enlarged, and swollen into a knob.

Fam. MUTILLIDÆ.

Genus PSAMMOTHERMA, Latr.

Psammotherma flabellata. (Pl. XXI. fig. 6.)

Male.—Length 5 lines.

Black; strongly punctured; the prothorax and tegulæ ferruginous; the antennæ bipectinate; the wings brown; the posterior margin of the first and second segments of the abdomen narrowly edged with white pubescence, the third segment clothed with similar pubescence.

The female has the pro- and meso-thorax entirely red.

This species of *Mutilla* is from Senegal.

Fam. POMPILIDÆ, Leach.

Genus CTENOCERUS, Dahlb.

Ctenocerus ramosus. (Pl. XXI. fig. 4.)Male.—Length $\frac{3}{4}$ of an inch.

Black, the mandibles and labrum ferruginous; the antennæ ferruginous, with the scape black and furnished beneath with a long dense floccus of black hair; the wings yellow and subhyaline; the apex of the wings with a dark brown border; the neuration pale ferruginous; the anterior tibiæ and tarsi obscurely ferruginous; the head very convex in front; the thorax

elongate, longer than the abdomen, and also wider; the metathorax oblong and covered with a dense black pubescence; the abdomen covered with a sericeous reflexion.

The female closely resembles the male, and is similarly coloured; the antennæ are simple, dusky above, ferruginous beneath, two or three of the apical joints being entirely so; the abdomen is very smooth and shining and as long as the head and thorax.

Length $\frac{9}{10}$ of an inch.

This species was taken by Dr. Kannemeyer, at Burgerdorp, a Dutch settlement in South Africa.

The only character that separates this insect from many species of *Pompilidæ* is the pectination of the antennæ of the male; it is however, perhaps, desirable to retain Dahlbom's genus for the reception of such species as have similar antennæ; the type is the *Ctenocerus Klugii*, Dahlb., subsequently described by Lucas under the name *Clavelia pompiliformis*, Ann. Ent. Soc. Fr. 1852.

Fam. ANDRENIDÆ, Leach.

Genus LAMPROCOLLETES, Smith.

Lamprocolletes cladocerus, Smith. (Pl. XXI. fig. 3.)

See Trans. Ent. Soc. ser. 3, i. 57.

Black; the face and cheeks clothed with hoary pubescence, the mandibles ferruginous at their apex; the joints of the antennæ bipectinate, the pectinations irregularly toothed; thorax shining, finely punctured, thinly clothed with hoary pubescence; the wings hyaline and iridescent; the claw-joint of the tarsi ferruginous, the calcaria pale testaceous; abdomen shining, margins of the segments depressed; finely punctured, and with a thinly scattered hoary pubescence.

Male.—Length $4\frac{1}{4}$ lines.

Taken near Sydney, Australia.

This remarkable bee is still unique in the British Museum. The beautiful ramose antennæ of the male present perhaps the most remarkable example of those organs known in the entire tribe of the *Aculeata*; such an extraordinary departure from the normal form of antenna could scarcely have been looked for in the *Apidæ*, and if met with at all, might with much greater probability have been expected to occur amongst the *Tenthredinidæ*.

Genus NOMIA, Latr.

Nomia Kirbii, Westw. MS. (Pl. XXI. fig. 5.)

Male.—Length 7 lines.

Black; the head narrower than the thorax; the face and posterior margin of the vertex with a thick sooty-black pubescence; the antennæ a little shorter than the thorax, the apical joint compressed; the thorax clothed with short sooty pubescence; the wings dark brown; the anterior tibiæ and tarsi fringed behind with sooty pubescence; the intermediate femora incrassate and compressed beneath into a semidentate process; the posterior tibiæ also much swollen, forming a subtriangular mass which has a tooth at its inferior angle; abdomen ovate and shining, being thinly covered with sooty pubescence.

This species is from Brazil; it formed part of the Collection of the Rev. W. Kirby, and is now in the British Museum.

Fam. APIDÆ.

Genus TETRALONIA, Spin.

Tetralonia mirabilis. (Pl. XXI. fig. 2.)Male.—Length $\frac{1}{2}$ an inch.

Head and thorax black; the clypeus, labrum and mandibles yellow, the base of the former black and the apex of the latter ferruginous; the face, cheeks and hinder margin of the vertex thickly clothed with long pale fulvous hair; the antennæ elongate, extending to the middle of the abdomen; the scape, first and base of the second joint of the flagellum black, the third to the eighth joints, which are cylindric and of about equal length, ferruginous and of the usual form, the three following attenuated to the thinness of a hair, the apical joint being black, flattened and pear-shaped; the thorax clothed above with fulvous pubescence, much paler beneath; the tegulæ, base of the nervures of the wings and the legs ferruginous; the wings subhyaline, the nervures fusco-ferruginous, the costal nervure blackish; abdomen reddish-brown, the basal margins of the segments with broad fasciæ of fine short pale downy pubescence.

The species is from Rio.

Notwithstanding the remarkable form of the antennæ of this insect, I leave it for the present in the genus *Tetralonia*; should other species occur with similar antennal peculiarities, they may be conveniently separated from *Tetralonia*, and constitute a new genus.

Genus CHALICODOMA.

Chalicodoma cælocera, Smith. (Pl. XXI. fig. 7.)

This species was described in the Catalogue of *Apidæ*, published by the Trustees of the British Museum; it was there included in the genus *Megachile*; subsequently Herr Gueinzus forwarded from Port Natal both sexes of the insect and the nest, which proved it to belong to the genus *Chalicodoma*, which constructs mud nests on walls, &c. The sexes are similarly coloured, black and pubescent, with the abdomen bright fulvous-red, except the basal segment, which is black; the wings are dark brown; in the male sex, the antennæ are clavate and hollowed out beneath, and the anterior tarsi are expanded as in the males of *Megachile*.

Length $\frac{2}{3}$ of an inch.

EXPLANATION OF PLATE XXI.

(All the figures are considerably magnified.)

- Fig. 1. *Thaumatosoma Duboulaii*, ♂; 1a, antenna.
2. *Tetralonia mirabilis*, ♂, antenna.
3. *Lamprocolletes cladocerus*, ♂; 3a, antenna; 3b, underside of antenna.
4. *Ctenocerus ramosus*, ♂, antenna; 4a, underside of ditto.
5. *Nomia Kirbii*, ♂, antenna.
6. *Psammotherma flabellata*, antenna; 6a, underside of a few joints of ditto.
7. *Chalicodoma cælocera*, ♂, antenna; 7a, underside of ditto.